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Schematic beliefs and problem solving performance predict depression in people experiencing persecutory delusions

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Schematic beliefs and problem solving performance predict depression in people experiencing persecutory delusions

Abstract

Depression occurring alongside psychosis is an important treatment target, both in its own right and as a potential maintenance factor for positive psychotic symptoms. The present paper reports a prospective longitudinal analysis of depression and its predictors over six months in a group of 60 participants experiencing persecutory delusions. We hypothesised that negative schematic beliefs about the self and problem solving difficulties would predict the persistence of depression over time. The results showed, as hypothesised, that more negative schematic beliefs about the self and poorer problem solving predicted higher depression scores six months later, beyond what could be predicted by baseline depression scores. These findings support a proposed role for schematic beliefs and problem solving difficulties in the perpetuation of depression occurring alongside psychosis, as has been substantiated for major depressive disorder. Interventionist research is warranted to confirm causal effects.

Keywords

Persecutory delusions; depression; psychosis; schematic beliefs; problem solving; longitudinal

Introduction

Depression is known to be common among people with persecutory delusions (Vorontsova et al., 2013). The importance of such depression as a treatment target in its own right is supported by its associations with suicide, low quality of life, functional impairment and future relapses (Conley et al., 2007). Freeman and colleagues argued that depression also acts as a key maintenance factor for persecutory delusions (Freeman et al., 2002). This theory is substantiated by empirical findings that depression predicts the persistence of paranoia over time (Fowler et al., 2012; Vorontsova et al., 2013). Amelioration of comorbid depression is therefore also a potential therapeutic target in the

treatment of persecutory delusions. An improved understanding of what maintains depression in this group will facilitate development of therapies to treat it, which has the potential to also impact the course of delusions, as well as improving functional outcomes.

Several cognitive factors have established associations with the persistence of major depressive disorder: a summary may be found in Vorontsova et al. (2013). Two factors were of particular interest in the present study: negative schematic beliefs and problem-solving difficulties. As we discuss below, each of these plays a plausible theoretical role in the perpetuation of depression, each has shown associations with the persistence of symptoms, and each has links to a targeted evidence-based therapeutic intervention.

Negative schematic beliefs about the self lie at the heart of cognitive theories of depression, and are proposed to perpetuate negative affective states by colouring the interpretation of ongoing experience (Beck, 1979; Clark & Beck, 1999). Interventions targeting beliefs about the self have shown evidence of effectiveness in ameliorating depression in groups of people experiencing psychosis (Freeman et al., 2014; Hall & Tarrier, 2003; Knight et al., 2006; Laithwaite et al., 2007), with two pilot studies finding concomitant effects on delusion severity (Freeman et al., 2014; Laithwaite et al., 2007).

Problem solving difficulties characterise groups with depression compared to non-clinical controls (Marx et al., 1992), and have been shown to predict the persistence of depression over time (Garland et al., 2000). Problem solving difficulties are thought to perpetuate depression by limiting an individual's effectiveness in tackling every-day challenges. Improvements in performance have been achieved with problem solving therapy, which has shown effectiveness in ameliorating depression (Bell & D'Zurilla, 2009).

Vorontsova et al. (2013) examined schematic beliefs and problem solving difficulties in a prospective longitudinal study of 60 individuals experiencing persecutory delusions. Negative schematic beliefs

about the self and problem solving difficulties each significantly predicted the persistence of paranoia over six months, with baseline paranoia controlled. The present paper presents a previously unpublished secondary analysis of data from the same study, with novel hypotheses concerning the prediction of depression persistence. Given the reciprocal relationship between paranoia and depression, it is expected that some of the same factors could contribute to the persistence of both difficulties (Moritz et al., 2017; Zavos et al., 2016). We therefore hypothesised that more negative beliefs about the self and poorer problem solving performance would predict higher depression scores at six-month follow-up, with baseline depression scores controlled.

Methods

Participants completed all of the study measures twice, six months apart, so that predictors of symptom change could be examined.

Participants

Sixty individuals with persecutory delusions and schizophrenia-spectrum diagnoses were recruited, and 54 (90%) completed assessments at both time points. The mean age was 41.2 years ($SD = 10.1$); 32 participants were male, and 22 were female. The sample is described further in Vorontsova et al. (2013).

Measures

Depression was measured using the Beck Depression Inventory (BDI-II; Beck et al., 1996). Schematic beliefs in four categories (Positive Self, Negative Self, Positive Other, and Negative Other) were measured using the Brief Core Schema Scales (BCSS; Fowler et al., 2006).

Problem solving was assessed using the Means-Ends Problem-Solving Procedure (MEPS; Platt & Spivack, 1975), following Marx et al. (1992). Participants were asked to provide a solution to three social problem-solving scenarios. Answers were scored on the number of relevant steps generated and the solution's effectiveness. Responses were re-scored by an independent rater, with inter-rater

reliability correlation coefficients (ICC) .93 for number of relevant means and .92 for overall effectiveness, both $p < .01$.

Analysis

Partial correlation analysis was used to identify significant predictors of follow-up depression, with baseline depression controlled. A hierarchical multiple regression analysis then examined whether adding cognitive factors to a predictive model would explain significantly more variance in depression outcome compared to a model with baseline depression as the only predictor.

Results

The mean baseline BDI depression score was 24.96 (SD = 15.6), and the mean follow-up BDI score was 23.85 (SD = 16.47). Baseline and follow-up BDI scores were significantly correlated, $r = .87$, $p < .01$, indicating 75% shared variance.

Partial correlations indicated significant associations of follow-up BDI scores with baseline BCSS Negative Self scores, and with both MEPS problem solving indices (see Table 1).

Variable	Partial correlation with follow-up BDI scores	Uncontrolled correlation
<u>Schematic beliefs: Brief Core Schema Scales (BCSS)</u>		
Negative Self	$r = .38$, $p = .01$ *	$r = .84$, $p < .01$ *
Positive Self	$r = .17$, $p = .22$	$r = -.52$, $p < .01$ *
Negative Other	$r = .16$, $p = .27$	$r = .36$, $p < .01$ *
Positive Other	$r = .12$, $p = .39$	$r = -.20$, $p = .14$
<u>Means-Ends Problem Solving (MEPS)</u>		
Total means	$r = -.32$, $p = .02$ *	$r = -.16$, $p = .25$
Effectiveness	$r = -.31$, $p = .03$ *	$r = -.25$, $p = .07$

*Table 1. Partial correlations of baseline BCSS and MEPS with follow-up BDI scores, controlling for baseline BDI scores, and uncontrolled correlations (without controlling for baseline BDI). * indicates significance at $p < .05$ level.*

MEPS means and effectiveness scores were highly inter-correlated ($r = .93, p < .01$), so both could not be meaningfully included as predictors in a regression model. MEPS total means scores and BCSS Self Negative scores were therefore used. A hierarchical linear regression model was run, with follow-up BDI scores as the dependent variable, baseline BDI scores as predictor at the first step, and baseline cognitive predictors added at the second step (see Table 2).

Step 1	B	SE B	β	p
Constant	0.17	2.19		
Baseline BDI	0.95	0.08	.87	< .01
Step 2				
Constant	7.17	3.16		
Baseline BDI	0.65	0.13	.59	< .01
BCSS Negative Self	0.76	0.29	.32	.01
MEPS total means	-0.67	0.26	-.16	.01

$R^2 = .75$ for Step 1, $\Delta R^2 = .05$ for Step 2 ($p < .01$).

Table 2. Hierarchical multiple regression model predicting follow-up BDI scores.

The addition of the two cognitive factors to the model led to a significant increase in R^2 , explaining a further 5% of variance in follow-up BDI scores, $F(2, 50) = 6.94, p < .01$. The final model had significant fit to the data, $F(3, 50) = 69.36, p < .01$, with adjusted $R^2 = .80$. Each factor significantly predicted follow-up BDI scores with the others held constant. β values indicated that negative belief scores had more impact in the model than problem solving scores. The regression analysis was re-

run with MEPS effectiveness scores instead of total means scores: the pattern of significant effects was the same.

Discussion

Negative schematic beliefs and problem solving difficulties are both implicated in depression persistence, and each is associated with an evidence-based psychological intervention. This is the first known study to have examined these two factors together as prospective predictors of depression in a group of people experiencing persecutory delusions. More negative schematic beliefs about the self and poorer problem solving predicted more severe depression six months later, as hypothesised, accounting for 5% of outcome variance over and above what could be predicted from baseline depression severity. Baseline depression accounted for 75% of variance in follow-up depression scores, leaving limited scope for further predictors; nevertheless, each of these two cognitive factors showed a small but significant unique effect. More negative beliefs about others and fewer positive beliefs about the self were also associated with more depression six months later, but these associations disappeared with baseline depression controlled.

Negative beliefs showed a greater influence than problem solving performance in our model.

Negative beliefs about the self may perpetuate depression by negatively colouring the interpretation of ongoing experience. This is consistent with Fowler et al.'s (2012) finding that negative self beliefs and low mood were reciprocally associated over time in a group with psychosis. Our finding regarding problem solving is novel in a group with persecutory delusions, and calls for replication. Difficulties with problem solving may perpetuate depression by impairing the individual's ability to navigate ongoing interactions, thereby exposing them to less favourable situations.

Negative self beliefs and problem solving difficulties have also been found to predict the persistence of paranoia in the same group (Vorontsova et al., 2013). Our findings are consistent with mounting

evidence that depression and paranoia show considerable overlap in etiological factors, and are reciprocally associated, such that higher levels of each predict higher levels of the other over time (Fowler et al., 2012; Moritz et al., 2017; Zavos et al., 2016). A clinical implication is that amelioration of key shared factors could have dual effects, in helping to interrupt the cycles of both depression and persecutory thinking. Our findings support ongoing trials of specific interventions targeting both negative and positive self beliefs for people experiencing persecutory delusions (Freeman et al., 2014), and the inclusion of such techniques, as well as problem solving components, in broader modular packages of psychological therapy (Freeman et al., 2016).

The observational nature of this study precludes any conclusions about directions of causality. However, the prospective longitudinal design afforded observation of relationships over time, which can indicate plausible causal connections. The participant sample was selected for the presence of persecutory delusions, which limits the conclusions that may be drawn about depression predictors outside of this specific group. The stability of depression in our sample limited the scope to examine other predictors of change: future research in a less stable sample may elucidate predictive effects further. Inclusion of more detailed assessments of beliefs and problem solving could elaborate our understanding of the most instrumental aspects of these factors. Interventionist studies targeting these processes can then test causal hypotheses.

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